

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1.(Currently Amended) An isolated nucleic acid ~~selected from the group consisting of:~~
encoding a protein comprising the amino acid sequence of SEQ ID NO:2.

(a) ~~— a nucleic acid encoding a protein comprising the amino acid sequence of~~
~~SEQ ID NO:2 or a fragment thereof;~~

(b) ~~— a nucleic acid comprising a coding region of the nucleotide sequence of~~
~~SEQ ID NO:1;~~

(c) ~~— a nucleic acid encoding a protein that comprises the amino acid sequence of~~
~~SEQ ID NO:2, in which one or more amino acids are substituted, deleted, inserted and/or added~~
~~and that is functionally equivalent to a protein consisting of the amino acid sequence of SEQ ID~~
~~NO:2;~~

(d) ~~— a nucleic acid that hybridizes under stringent conditions with a nucleic acid~~
~~consisting of the nucleotide sequence of SEQ ID NO:1, and that encodes a protein functionally~~
~~equivalent to a protein consisting of the amino acid sequence of SEQ ID NO:2; and~~

(e) ~~— a nucleic acid encoding a protein that has at least 60% identity to the amino acid~~
~~sequence of SEQ ID NO:2.~~

2. (Currently Amended) An isolated nucleic acid encoding the amino acid sequence of SEQ ID NO:2 or a fragment thereof, wherein the fragment is at least 40% of the length of the sequence shown as SEQ ID NO:2 and encodes a protein that binds to BMP2/4.

3. (Currently Amended) The nucleic acid of claim 1 44, wherein the number of amino acids substituted, deleted, and/or inserted ~~and/or added~~ is ~~30~~ 5 or fewer.

4.(Original) The nucleic acid of claim 1, wherein the nucleic acid encodes a fusion protein comprising a first amino acid sequence as shown in SEQ ID NO:2 fused to a second amino acid sequence.

5. (Original) A vector into which the nucleic acid of claim 1 is inserted.

6. (Original) A vector into which the nucleic acid of claim 2 is inserted.

7. (Original) A transformant harboring the nucleic acid of claim 1.

8. (Original) A transformant harboring the nucleic acid of claim 2.

9. (Original) A transformant harboring the vector of claim 5.

10. (Original) A transformant harboring the vector of claim 6.

11. (Withdrawn) A substantially purified polypeptide encoded by the nucleic acid of claim 1.

12. (Withdrawn) A substantially purified polypeptide encoded by the nucleic acid of claim 2.

13. (Currently Amended) A method for producing a polypeptide, the method comprising the steps of culturing the transformant of claim 9 and recovering the protein ~~a polypeptide~~ ~~expressed~~ from the transformant or from the culture supernatant thereof.

14. (Currently Amended) A method for producing a polypeptide, the method comprising the steps of (a) culturing the transformant of claim 10 and (b) recovering the protein a ~~polypeptide expressed~~ from the transformant or from the culture supernatant thereof.

15. (Withdrawn) An antibody against the polypeptide of claim 11.

16. (Withdrawn) An antibody against the polypeptide of claim 12.

17. (Currently Amended) A polynucleotide that comprises 15 nucleotides and hybridizes under stringency conditions of 50% formamide, 5x SSPE, 1x Denhardt's solution, and 1x salmon sperm DNA with the a nucleic acid comprising consisting of the nucleotide coding sequence of SEQ ID NO:1 or the complement of the coding sequence. ~~complementary strand thereof and that comprises at least 15 nucleotides.~~

18. (Withdrawn) A method for screening for a compound that binds to the polypeptide of claim 11, the method comprising the steps of:

- (a) contacting a test sample with the polypeptide or a partial peptide thereof,
- (b) detecting a binding activity of the test sample to the polypeptide or the partial peptide thereof, and
- (c) selecting a compound comprising the binding activity to the polypeptide or the partial peptide thereof.

19. (Withdrawn) A method for screening for a compound that binds to the polypeptide of claim 12, the method comprising the steps of:

- (a) contacting a test sample with the polypeptide or a partial peptide thereof,
- (b) detecting a binding activity of the test sample to the polypeptide or the partial peptide thereof, and

(c) selecting a compound comprising the binding activity to the polypeptide or the partial peptide thereof.

20. (Withdrawn) A compound isolated by the method of claim 18.

21. (Withdrawn) A compound isolated by the method of claim 19.

22. (New) An isolated nucleic acid selected from the group consisting of:

(a) a nucleic acid encoding a protein that comprises the amino acid sequence of residues 25-222 of SEQ ID NO:2;

(b) a nucleic acid encoding a protein that comprises the amino acid sequence of residues 25-222 of SEQ ID NO:2 in which 15 or fewer amino acids are substituted, deleted, and/or inserted and that has an activity for rescuing aberrations in the differentiation of dorsal midline cells when injected into a TSG mutant of *Drosophila*, or an activity that regulates embryo development when injected into *Xenopus* eggs;

(c) a nucleic acid, the complement of which hybridizes under stringency conditions of 50% formamide, 5x SSPE, 1x Denhardt's solution, and 1x salmon sperm DNA with a probe consisting of the nucleotide sequence of the coding sequence of SEQ ID NO:1, wherein the nucleic acid encodes a protein having an activity for rescuing aberrations in the differentiation of dorsal midline cells when injected into a TSG mutant of *Drosophila*, or an activity that regulates embryo development when injected into *Xenopus* eggs; and

(d) a nucleic acid encoding a protein that has at least 90% identity to the amino acid sequence of SEQ ID NO:2 or of residues 25-222 of SEQ ID NO:2, and that has an activity for rescuing aberrations in the differentiation of dorsal midline cells when injected into a TSG mutant of *Drosophila*, or an activity that regulates embryo development when injected into *Xenopus* eggs.

23. (New) The nucleic acid of claim 22, wherein the nucleic acid is as described in (b) and the number of amino acids substituted, deleted, and/or inserted is 5 or fewer.

24. (New) The isolated nucleic acid of claim 22, wherein the nucleic acid is as described in (d) and the protein has at least 95% identity to the sequence of SEQ ID NO:2.

25. (New) The isolated nucleic acid of claim 24, wherein the protein has at least 98% identity to the sequence of SEQ ID NO:2.

26. (New) The isolated nucleic acid of claim 24, wherein the protein has at least 99% identity to the sequence of SEQ ID NO:2.

27. (New) An isolated nucleic acid encoding a polypeptide comprising the amino acid sequence of a fragment of SEQ ID NO:2, wherein the fragment is at least 40% of the length of the sequence shown as SEQ ID NO:2, and wherein the polypeptide has an activity for rescuing aberrations in the differentiation of dorsal midline cells when injected into a TSG mutant of *Drosophila*, or an activity that regulates embryo development when injected into *Xenopus* eggs.

28. (New) A nucleic acid encoding a fusion protein comprising a first amino acid sequence that has the sequence of residues 25-222 of SEQ ID NO:2 fused to a second amino acid sequence.

29. (New) The nucleic acid of claim 28, wherein the second amino acid sequence comprises any one of the following: glutathione S-transferase, FLAG, six histidine residues, influenza agglutinin (HA), human c-myc fragment, VSV-GP fragment, p18HIV fragment, T7-tag, HSV-tag, E-tag, SV40T antigen fragment, Ick tag, α -tubulin fragment, B-tag, Protein C fragment, immunoglobulin constant region, β -galactosidase, Green Fluorescent Protein (GFP), and maltose binding protein.

30. (New) The nucleic acid of claim 28, wherein the fusion protein comprises an initiator methionine.

31. (New) The nucleic acid of claim 28, wherein the fusion protein comprises a signal sequence.

32. (New) The nucleic acid of claim 28, wherein the fusion protein further comprises residues 1-24 of SEQ ID NO:2.

33. (New) A vector into which the nucleic acid of claim 27 is inserted.

34. (New) A vector into which the nucleic acid of claim 28 is inserted.

35. (New) A vector into which the nucleic acid of claim 29 is inserted.

36. (New) A transformant harboring the nucleic acid of claim 27.

37. (New) A transformant harboring the nucleic acid of claim 28.

38. (New) A transformant harboring the vector of claim 33.

39. (New) A transformant harboring the vector of claim 34.

40. (New) A transformant harboring the vector of claim 35.

41. (New) A method for producing a polypeptide, the method comprising the steps of culturing the transformant of claim 36 and recovering the polypeptide from the transformant or the culture supernatant thereof.

42. (New) A method for producing a protein, the method comprising the steps of culturing the transformant of claim 37 and recovering the fusion protein from the transformant or the culture supernatant thereof.

43. (New) An isolated nucleic acid comprising the coding region of the nucleotide sequence of SEQ ID NO:1.

44. (New) An isolated nucleic acid encoding a protein that (a) comprises the amino acid sequence of SEQ ID NO:2 in which 15 or fewer amino acids are substituted, deleted, and/or inserted, and (b) binds to BMP2/4.

45. (New) An isolated nucleic acid encoding a protein that binds BMP2/4, wherein the complement of the nucleic acid hybridizes under stringency conditions of 50% formamide, 5x SSPE, 1x Denhardt's solution, and 1x salmon sperm DNA with a probe consisting of the coding sequence of SEQ ID NO:1.

46. (New) An isolated nucleic acid encoding a protein that has at least 90% identity to the amino acid sequence of SEQ ID NO:2, and that binds to BMP2/4.

47. (New) The nucleic acid of claim 46, wherein the protein has at least 95% identity to the amino acid sequence of SEQ ID NO:2.

48. (New) The nucleic acid of claim 46, wherein the protein has at least 98% identity to the amino acid sequence of SEQ ID NO:2.

49. (New) The nucleic acid of claim 46, wherein the protein has at least 99% identity to the amino acid sequence of SEQ ID NO:2.

50. (New) An isolated nucleic acid that encodes a protein comprising residues 25-222 of SEQ ID NO:2.

51. (New) The nucleic acid of claim 50, wherein the protein comprises the amino acid sequence of SEQ ID NO:2.

52. (New) The nucleic acid of claim 50, wherein the protein consists of residues 25-222 of SEQ ID NO:2 with an initiator methionine or a signal peptide.

53. (New) The nucleic acid of claim 50, wherein the protein consists of the amino acid sequence of SEQ ID NO:2.